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EXAMINER

WERNER, BRIAN P

ART UNIT	PAPER NUMBER
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2621

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/748,138

Applicant(s)

IDE ET AL.

Examiner

Brian P. Werner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 5, 8, 9, 11-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Dimsdale et al. (US 2003/0001835 A1).

Regarding independent claim 16, Dimsdale discloses a 3D shape measuring system (figure 1; "three dimensions" at paragraph 0001) comprising:

a measuring section measuring a 3D shape of an object by scanning the object ("FDV) module ... scanning on object 20 and for sensing the position in three-dimensional space" at paragraph 0086; "coordinates in three-space" are calculated at paragraph 0227);

an instructing section instructing a stop of measuring by the measuring section ("the user is provided on the host a video representation of the scene from which he can choose a portion to be range scanned" at paragraph 0204; this portion is depicted at figure 17A, numeral 1720; this, instructions for starting and stopping the scan are input into the computer, and used to control the scanning); and

a storage section storing the 3D shape data measured before the stop of measuring ("each point returned is displayed in the data window 1620 as it is transmitted by the FDV 10" at paragraph 0228; thus, all of the data from the start to the stop of the scan is stored as it is transmitted from the scanner, before the stop of the scan).

Regarding claim 17, the scanning is two-dimensional (as depicted in figures 11A and 11B) in a one-way form ("scanning is uni-directional (i.e., always proceeds from left to right, or right to left, on parallel lines)" at paragraph 0158).

Regarding claim 18, the scanning is spiral ("spiral scanning" at paragraph 0161).

Regarding independent claim 1, 12, 13, Dimsdale discloses a 3D shape measuring system (figure 1; "three dimensions" at paragraph 0001) comprising:

a measuring section measuring a 3D shape of an object by scanning the object ("(FDV) module ... scanning on object 20 and for sensing the position in three-dimensional space" at paragraph 0086; "coordinates in three-space" are calculated at paragraph 0227); and

a display section (figure 15, numeral 1510) displaying information about an area where the scanning has been completed by the measuring section ("display and visualization of scanned points" at paragraph 0216) in accordance with a progress of the scanning ("real time 3D data acquisition" at paragraph 0216; "each point returned is displayed in the data window 1620 as it is transmitted by the FDV 10" at paragraph 0228; "while the data is arriving" at paragraph 0228; thus, each point is displayed as it is returned from the scanner and therefore the points are displayed in accordance with the progress of the scanning).

Regarding claim 2, the measuring section includes:

a scanning section changing measurement direction (figure 6A); and
a distance measuring section measuring distance to the object in each measuring direction ("each data point ... represents both distance to a corresponding laser impingement point ... and the angle from the origin point" at paragraph 0098; "the position in three-dimensional space of each scanned point" at paragraph 0090; "the laser is pulsed, the distance to the object 20 is usually measured by the time of flight" at paragraph 0102; one distance measurement is made for each scanned position, representing one scanning direction); and

the measuring section measures the 3D shape of the object based on the measured distance ("CGP module generates a CGP model 42" at paragraph 0087).

Regarding claim 3, distance is calculated by flight time of a pulsed laser ("time-of-flight" at paragraphs 0102 and 0103).

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Regarding claims 5 and independent claim 8 (refer to the claim 1 rejection, as well as that which is discussed below), a monitor image is taken (the “intensity of the reflected laser pulse” at paragraph 0227 is displayed, as depicted in figure 16B) and the display displays identifiably an area where the scanning has already completed and an area where the scanning has not completed yet based on the image obtained by the monitor imaging section (as described above, the intensity of the reflected laser pulses is displayed “while the data is arriving” and thus, areas that have arrived are displayed and areas that have not arrived are not displayed, in accordance with the progress of the processing).

Regarding claim 9, the measuring section includes:

a light source (figure 6, numeral 604);

a scanner (figure 6, numeral 504; also figure 6A);

a sensor receiving reflected light (figure 6, numeral 612); and

a calculator calculating distance (figure 2, numeral 40).

Regarding claim 11, the measured 3D shape is displayed (e.g., figures 16B and figure 19).

The limitations of claims 14 and 15 are met as described above with respect to claim 16.

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4. Claims 16, 19 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamamoto et al. (US 5,862,252 A).

Regarding independent claim 16, Yamamoto discloses a 3D shape measuring system (figure 1; "generating a 3-D geometrical shape" at column 1, line 21) comprising:

a measuring section measuring a 3D shape of an object by scanning the object (figure 1, numerals 1-5 and 9-12, and in figure 2; the object 6 is scanned with a laser);

an instructing section instructing a stop of measuring by the measuring section (figure 1, numeral 12; as depicted in figure 8, once the object has been scanned by one complete rotation, the processor 12 halts the scanning); and

a storage section storing the 3D shape data measured before the stop of measuring (figure 8, numeral S307; for each scan and at each minute rotation of the object, 3D data is stored in a table at figure 9, numeral 943).

Regarding claim 19, the scanning is performed by changing a relative position of the measuring section and the object (i.e., the object is rotated as depicted in figure 1, and as described in figure 8).

Regarding claim 20, the measuring section includes:

a rotary base for placing the object ("turntable" at column 7, line 16; figure 2, numeral 7); and

an imaging device fixed regardless of a rotation of the base (figure 2, numeral 10); and

the imaging device images for measurement the 3D shape of the object in a predetermined period rotating on the rotary base ("for each rotational angle, the distance for each line in the direction of the Z axis is measured" at column 15, line 59).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 4, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ritter et al. (US 6,363,169 B1) and Cohen et al. (US 6,222,937 B1).

Regarding independent claim 1, Ritter discloses a 3D shape measuring system (figures 1, 8 and 9) comprising:

a measuring section measuring a 3D shape of an object by scanning the object (figure 1, numeral 2; figure 8, numeral S2); and

a display section (figure 24, numeral S59) displaying information about an area where the scanning has NOT been completed by the measuring section ("displaying the next shooting point of view" at column 16, line 42).

Regarding claim 4, Ritter discloses:

scanning and imaging sections changing a measuring direction and taking a two-dimensional image of the object (figure 1, numeral 2 and figure 9A; a camera is moved to various positions around the object 12 where images are taken at each position);

a detection section detecting a silhouette of the two-dimensional image (figure 9B); and

the measuring section measuring the three-dimensional shape of the object based on the detected silhouette (figures 9C and 9D).

Regarding independent claim 1, Ritter does not disclose displaying information about an area where the scanning has been completed by the measuring section. Rather, as described above, Ritter displays information where an image needs to be taken.

Cohen also discloses a system for measuring a 3D shape of an object ("complete 3-dimensional image of an object" at column 1, line 15), wherein Cohen teaches displaying information about an area where the scanning has been completed by the measuring section (figure 7; "the user interface displays a representation of the stage 701 with a translucent hemisphere 702 surrounding the object" and "the user interface displays an indication of the different orientations from which pictures have been taken on the surface of the hemisphere" at column 7, lines 44-48).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to display, to the operator of the Ritter scanning and imaging unit, information about an area where the scanning as been completed as taught by Cohen, in order to "facilitate taking a reasonable sample" of vantage points (Cohen, column 7,

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line 42) by showing to the operator where the pictures have been taken in relation to the stage and object, as an visual and intuitive guide to the operator as to where additional pictures need to be taken.

The limitations of claims 8 and 10 are met by the above combination.

7. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Dimsdale et al. (US 2003/0001835 A1) and Akins et al. (US 5,309,555 A).

Dimsdale teaches "real time 3D data acquisition" at paragraph 0216, where "each point returned is displayed in the data window 1620 as it is transmitted by the FDV 10" at paragraph 0228 (i.e., the data is displayed "while the data is arriving" at paragraph 0228). While the Dimsdale display displays the 3D data according to the progress of the process of the scanning, Dimsdale does not teach displaying a message indicating the degree of progress as a percentage.

Akins discloses a system for processing and transmitting images, comprising displaying a message indicating the degree of progress as a percentage ("a status message at the bottom of the Telesketch primary window displays 'percentage done' progress indicators so the users can see how far along the transmission has progressed" at column 12, line 40).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the display of Dimsdale, according to the teaching of Akins, by providing a status message to indicate the degree of progress of the scanning and

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transmission so that the user can "see how far along the transmission has progressed" (Akins, column 12, line 40), thereby providing the use with information as to when the scanning will be completed and when the scanning is completed so that a next scan can be undertaken, and whether or not there is a problem with the scanning or transmission (i.e., it is taking too long or the progress has stopped).


Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 703-306-3037. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Brian Werner
Patent Examiner
Art Unit 2621
October 9, 2003



BRIAN WERNER
PRIMARY EXAMINER